

surface slopes and velocities. Independent estimations were also made from gravity profiles across the glaciers, but the data were complete enough to allow a comparison between the methods on only one profile, that across the Baltoro Glacier at Urdukas. Here the gravity anomaly gave a maximum depth of 390 m. from the velocity. If, however, a better approximation than a semi-ellipse was used for the cross-section of the glacier, the depth indicated by the gravity anomaly increased to 465 m. This chapter of the book occupies only 16 of its 242 p.

However, for those concerned more broadly with the planning, execution and interpretation of the geophysical work of expeditions to mountainous regions, this report would repay some study. The methods of observation and reduction used are described in considerable detail (sometimes the detail seems unnecessarily great) and emphasis is placed upon the practical problems encountered in carrying out work of this kind which tend to be glossed over on brief publication in a journal.

The principal aim of the expeditions has been to establish gravity stations in the high Karakoram where observations have hitherto been few. The success of the 1954–55 seasons can be measured by the 198 stations for which both gravity and height were measured, using a Worden gravimeter and aneroid levelling, respectively. Of these stations, 69 were selected for complete topographic and isostatic reductions; enough to fill a considerable gap in the Bouguer and isostatic anomaly maps of the area, which has of course been one of considerable interest for over a century since the geodetic work of Everest led to the development of the theory of isostasy.

A programme of magnetic observations was also carried out, over 50 absolute values of vertical and horizontal geomagnetic field being determined, with measurements of declination at nine of the stations.

In addition to the work of the expedition itself, a short review of the seismicity of the area, by M. A. Choudhury of the Geophysical Institute at Quetta is included. This includes a reference to a determination of crustal thickness in the Hindu Kush by the identification of P and S phases originating from deep-focus earthquakes there and reflected at the base of the crust before their reception. The great crustal thickness of about 75 km. obtained by this method is in good agreement with that obtained by Soviet geophysicists using conventional large-scale refraction seismology.

The concluding chapters of the book review previous geological interpretations of the gravity field of the region (it is unfortunate that this chapter is illustrated only by cross-sections which are not easy to follow in the absence of a geological map) and summarize the conclusions drawn by the author from the augmented information now available. The negative isostatic gravity anomalies are attributed in places to alluvial material but more importantly to low-density granitic rocks emplaced along the axis of the Karakoram and the Hindu Kush. This thickening of the "granitic layer" of the crust is in accordance with the results of the Russian seismic soundings, and the author suggests that the emplacement of the large axial batholith was of fundamental importance in the Himalayan orogenic process.

An extensive bibliography of the geology and geophysics of the area is included, and the book is clearly written and well produced.

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G. WAGNER. *Klimatologische Beobachtungen in Südostspitzbergen 1960*. Wiesbaden, Franz Steiner Verlag GmbH, 1965. [vii], 69 p., illus. (Ergebnisse der Stauferland-Expedition 1959/60 (Deutsche Expedition nach Südostspitzbergen), Ht. 10.) DM. 26.

THIS report is based on data taken at two stations on Barentsøya in south-east Svalbard. "Wurzburger Hütte" is at a height of 16 m. and "Hohenstaufen" at 402 m. above sea-level on the north side of Freemansundet. The data are condensed in the appendix into two

tables. The first is in the form of a weather log which gives pressure, temperature, dew point, wind direction and speed, and amount and type of cloud at about 08.00, 13.00 and 21.00 hr. for the period 24 June to 28 August 1960. The second gives the actual temperatures recorded at the two stations at the same hours during July and August. Two graphs in the appendix compare these data with similar data from the two permanent stations in Vestspitsbergen at Isfjord Radio and Longyearbyen.

The report is in two sections. The first covers 28 p. and describes in detail the weather experienced in the Svalbard area. The two months when the expedition was at Barentsøya are divided into fifteen weather periods during which there was a general alternation between high and low pressure systems. The resultant changes in the various meteorological elements, particularly cloud, circulation, sunshine and temperature, are explained in terms of the surface pressure and the 500 mb. contour charts. The eleven photographs at the end of the paper show some of the cloud types experienced.

The second section of the report is only 15 p. long and compares the polar summer in south-east Svalbard with the weather in Vestspitsbergen. This comparison shows the effect of the synoptic situation and topography.

On the synoptic scale, differences in wind direction between east and west Svalbard are stated, rather obviously, to be due to the relief in Freemansundet. At the Barentsøya stations rising temperatures were generally associated with south-west winds due to the passage of lows and their fronts across the area. Similarly low temperatures occurred with the east-north-east winds of highs and ridges.

Next the author describes local differences in temperature and cloudiness, and he compares his results with those of previous expeditions since 1912. Throughout most of the twentieth century, July has been warmer than August in Svalbard, and this was also true for 1960. Temperature differences between the two Barentsøya stations are due entirely to height. "Wurzbürger Hütte" was warmer on average and experienced a smaller range of temperature. However, the range of extreme temperatures recorded at the two stations showed that it was greater at "Hohenstaufen" in July and at the lower station in August. This was due to low cloud and fog at the latter.

The main criticism of the paper is the disproportionate length between the two main sections. The reviewer feels that more emphasis could have been placed on the actual results of the expedition. Also, these could have been presented in a more conventional tabular form. Minor criticisms are the fact that two units of pressure are used. Surely the pressure data of the expedition which are reported in mm. could have been converted to millibars, particularly as all the surface maps and the Vestspitsbergen data are given in the latter units. Finally, the reviewer would have preferred the location map (Fig. 24) at the beginning of the paper and for it to have incorporated some indication of relief and the position of Isfjord Radio and Kapp Lee.

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